MACTEC ENVIRONMENTAL RESTORATION SERVICES, LLC

Spectral Gamma-Ray Borehole Log Data Report

Log Event A

Borehole 51-01-02

Borehole Information

Farm : TX	**Tank :** TX-101	**Site Number :** 299-W15-166
N-Coord : 41,680	**W-Coord :** 75,710	**TOC Elevation :** 673.05
Water Level, ft :	**Date Drilled :** 1/31/1974	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 112	

Borehole Notes:

According to the driller's records, this borehole was not perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing.

Equipment Information

Logging System : 1	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1995	**Calibration Reference :** GJPO-HAN-3	**Logging Procedure :** P-GJPO-1783

Logging Information

Log Run Number : 1	**Log Run Date :** 12/20/1995	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 108.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 14.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 12/21/1995	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 15.5	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Logging Operation Notes:

Analysis Information

Analyst : P.D. Henwood

Data Processing Reference : P-GJPO-1787 Analysis Date : 08/12/1996

Analysis Notes :

This borehole was logged by the SGLS in two logging runs. The pre- and post-survey field verification spectra met the acceptance criteria established for the peak shape and detector efficiency, confirming that the SGLS system was operating within specifications. Corrections for gain drift during data collection were not necessary during processing of the data to maintain proper peak identification. The energy calibration and peak-shape calibration from these verification spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

The SGLS data was processed using a casing-correction factor for 0.280-in.-thick steel casing.

Depth overlaps, where data were collected by separate logging runs over the same depth interval, occurred in this borehole between depths of 14.5 and 15.5 ft. The concentrations of Cs-137 and the natural radionuclides K-40, U-238, and Th-232 were calculated using both the original and repeated log data sets at the overlapping points. The calculated concentrations of Cs-137, K-40, Th-232, and U-238 using the separate data sets were within the statistical uncertainty of the measurements, indicating very good repeatability of the radionuclide concentration measurements.

Cs-137, processed U-238, and processed U-235 were the only man-made radionuclides identified in this borehole. The presence of Cs-137 was measured almost continuously from the ground surface to about 35 ft, at intermittent locations in the remainder of the borehole, and at the bottom of the borehole. The maximum Cs-137 concentration was about 15 pCi/g from 1 to 3 ft in depth.

Processed U-238 and U-235 are indicated at concentrations of up to about 49 and 4 pCi/g, respectively. Processed U-238 was measured continuously from about 67.5 to 69.5 ft and at 61.5 and 71.5 ft; processed U-235 was identified at similar depth locations.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank TX-101.

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (e.g., K-40, U-238, and Th-232). The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes both the man-made and natural radionuclides, in addition to the total gamma

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derived from the spectral data and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

Results/Interpretations: